

## Description of New Species of Hymenoptera from Borneo.

### A.—On some new species of *Iphiaulax* (*Braconidae*) from Kuching, Borneo.

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I am indebted to Mr. John Hewitt, the Curator of the Sarawak Museum, for the opportunity of describing the following species of *Iphiaulax* which appears to be the most abundant genus of Hymenoptera in Malaya, so far as the number of species is concerned.

The species may be most conveniently grouped by the form of the plate on the base of the 2nd abdominal segment.

- i. The plate large, triangular, striated, bordered by oblique striæ. *Insignis*, Sm., *cariniceps*, Cam., *octofoveatus*, Cam. In this group the 1st abdominal segment is closely longitudinally striated, and the metanotum is more or less black.
- ii. The plate minute smooth, followed by a keel which extends to the apex of the segment; the central part bordered by keels; the 1st segment keeled laterally and down the centre. *Alienatus*, Cam.
- iii. The plate moderately wide at the base, becoming gradually narrowed to a fine point, then continued as a keel to the apex of the segment. In this group the striation does not extend beyond the middle of the 3rd segment, the following segments being smooth. There is a distinct keel down the middle of the 1st abdominal segment and a less distinct one along the sides. *Extraneus*, Cam., *enrythecus*, Cam., and *declinatus*, Cam.

- iv. The plate striated, gradually narrowed to a point at or near the apex of the segment. The striation in this group extends to the apex of the 4th abdominal segment. The 1st abdominal segment is more or less striated and the metanotum is more or less black; in *longiceps* it is strongly striated. *Longiceps*, Cam.; *lineativentris*, Cam.; *pallidiorbitalis*, Cam., which is noteworthy for the head being largely pale yellow.

✓ *Iphiaulax insignis*, Sm. (*Bracon*)

*Bracon insignis*, Smith, Journ. Linn. Soc., 1857, 123.

*Iphiaulax insignis*, Szepilgeti, Termes. Füzetek, XXIV. 372. ?

This long-tailed species has been taken by Mr. Hewitt in September. The ♀ is 22 mm. long; with the ovipositor 83 mm.; its 1st abdominal segment is closely longitudinally striated; the area on 2nd segment is large triangular, ending in a sharp point, not reaching to the base of the apical third of the segment; it is bordered by stronger, oblique striæ, the rest of the segment bears close, more or less interlacing striæ; the 3rd to near the apex and the basal two-thirds of the 4th are closely striated, the striæ radiating from the middle; the rest of the abdomen smooth, bare shining. The face is tinged with yellow; the head somewhat thickly covered with black pubescence. Basal half of mandibles red, tinged with yellow, the apical black. Palpi pale red, covered with pale pubescence.

The *I. insignis* of Szepilgeti, quoted above from Java, is probably different from Smith's insect, from Borneo; Smith gives the length of the ovipositor as 44 lines; Szepilgeti gives the length of his *insignis* as 55 mm.; the body length being 20 mm. Of the known Bornean species the present can only be confounded with *I Shelfordi*, Cam. (Journ. St. Br. Roy. As. Soc. 1903, 103), which is smaller (15 mm.), but with the ovipositor longer (95 mm.), the striation only extends on the abdomen to the middle of the 3rd segment; the area on the 2nd is longer, being twice longer than its greatest width;

and the sheaths of the ovipositor are broadly white at the apex, the sheaths in *insignis* being entirely black. In *insignis* the 1st abdominal segment is more than twice longer than it is wide at the apex.

✓ *Iphiaulax cariniceps*, sp. nov.

Black, the head, thorax, except the centre of metanotum broadly, the anterior legs, the middle, except the tarsi, and the base of hind coxæ, red; wings fuscous violaceous, the nervures and stigma in part testaceous; the middle of face depressed, with a stout keel down the middle, the 1st, 2nd, the 3rd, except at the apex and the basal half of the 4th abdominal segment strongly closely longitudinally striated; the area on 2nd segment triangular, slightly longer than it is wide at the base; closely longitudinally striated, reaching to the middle of the segment. ♀

Length 14 mm., Sterebra 42 mm.

Kuching. March.

Face coarsely, rugosely not closely punctured, sparsely covered with black hair; the clypeus more closely and finely punctured. Front broadly depressed, the depression deep, clearly defined, twice the width of the lateral part, which is closely, distinctly punctured and sparsely covered with black hair; the centre is bare, aciculated, shining. Antennal scape, shining, bare, not much dilated at the apex, about 3 times longer than thick. Malar space furrowed, the depression much widened below. Thorax smooth, parapsidal furrows deep; the metanotum thickly covered with black hair. The 1st abdominal segment is fully one third longer than wide, the basal half with a rounded slope; the central part of the 2nd is bounded by a keel which converges towards the apex; the part bounding the area stoutly, obliquely striated, the part at its apex is more finely and closely longitudinally striated; outside the keel is a depression, closely, strongly obliquely striated, and with a large, almost smooth depression at its apex; the outer edge closely, rugosely longitudinally striated. Suturaiform articulation wide, deep, crenulated, widened at the

outer edges; there is a narrower crenulated furrow at the base of the 3rd segment. The basal half of the wings has the fuscous colour suffused with fulvous, the nervures there being blackish; the nervures on the apical half are paler, fuscous in colour; the basal half of the stigma testaceous, the apex dark fuscous, legs somewhat densely pilose; the sheaths of the ovipositor more densely covered with stiffer black pubescence.

The wide triangular area on the 2nd abdominal segment is rare with the Bornean species of *Iphiaulax*. It is found with *I. inignis*, Sm.

*Iphiaulax octofoveatus*, sp. nov.

Black; the head, thorax and 4 anterior legs red; the median segment largely tinged with black; the middle tarsi blackish, wings fuscous, the nervures and stigma black; the apical half of the 1st, the 2nd entirely and the basal half of the 3rd, 4th and 5th segments in the centre, coarsely irregularly rugosely striated, the striæ irregular, more or less broken, the striæ on the 2nd stronger and more distinctly separated; the area broad, triangular, as long as it is wide at the base; a keel as long as itself runs from its apex to near the middle. The head and mesonotum sparsely, the metanotum and back of abdomen more densely covered with black hair. Face rugosely punctured, the centre raised and smoother. First abdominal segment of almost equal width, 3 times longer than it is wide at the base, slightly, but distinctly longer than the 2nd; the segments are all longer than wide; the abdomen is 3 times longer than the thorax; slender; the suturiform articulation crenulated, not bifurcated at the apex; there are oval foveæ on the sides of the 3rd to 6th segments. The hind coxæ are longer than usual, almost as long as the 1st abdominal segment and of almost equal width. Temples roundly narrowed, as long as the top of the eyes; the occiput rounded inwardly.

Length 12 mm.

Kuching. July.

A distinct species.

✓ *Iphiaulax alienatus*, sp. nov.

Black, the head, thorax and anterior legs red, the middle legs red, suffused with black, the 1st abdominal segment smooth, the middle with a stout keel, the sides with a weaker, more irregular keel, the 2nd segment and the basal two-thirds of the 3rd strongly irregularly striated, the 2nd with a central keel slightly, triangularly dilated at the base, extending to the apex of the segment, the central part bordered by keels which slightly converge towards the apex; the suturiform articulation wide, deep, crenulated; there is a wide, transverse depression shortly beyond the middle of the 3rd, where the striæ end; there are 3 stouter keels down the centre almost dividing the depression into 2 parts. Legs densely covered with long black pubescence. ♀.

Length 15 mm.; terebra 32 mm.

Kuching. August.

Face coarsely punctured-reticulated; the clypeus more finely reticulated, bordered all round by a keel. The 2nd abdominal segment is as long as the 1st, longer than the 3rd; on the outer, apical half of the central division is a longish curved depression; the striæ are stout, few in number and more oblique on the outer than on the inner parts; the central part of the 3rd, on either side of the central keels, is raised, smooth. Malar space not much more than half the length of the eyes. The basal two abscissæ of the radius together shorter than the apical.

✓ *Iphiaulax extraneus*, sp. nov.

Black, the antennal scape, head, thorax and front legs red, the middle femora tinged with red; wings fuscous, the nervures and stigma black. First abdominal segment smooth, keeled down the middle, the sides depressed; the central part is clearly raised and has perpendicular sides; the part bordering it below narrow, stoutly crenulated; the segment is slightly longer than the 2nd, which is stoutly striated to near the apex; its central area is smooth, narrow, bordered by raised keels; it becomes gradually narrowed to a fine point near the middle and is continued as a fine keel to the apex; the segment is smooth at

the base; there is a longish fovea, narrowed at the base, on either side of the apex; the 2nd segment is striated, finely closely broadly to shortly beyond the middle; the 3 central keels on the suturiform articulation are continued beyond the furrow, the lateral being much longer than the central, which does not extend much beyond the furrow; the sides near the apex are broadly depressed; there is a curved crenulated furrow at the base of the 3rd segment. Wings fuscous violaceous, the nervures and stigma black. ♀

Length 13 mm.; terebra 30 mm.

Kuching. September.

Face rugosely punctured-reticulated; the clypeus with a curved, finely punctured depression in the middle above. Temples as long as the top of the eyes, broadly rounded behind. Metanotum thickly covered with blackish hair. The basal 3 ventral segments of the abdomen white except for an oblique black spot on the 3rd. The 1st segment 3 times longer than it is wide at the apex.

✓ *Iphiaulax Eurythecus*, sp. nov.

Black, the head, thorax, anterior legs, the middle coxæ trochanters and femora for the greater part red, the metanotum large infuscated; wings fuscous violaceous, the nervures and stigma black; the plate on 2nd abdominal segment longish triangular, smooth at the base, finely closely striated at the apex, the keel narrow, extending to the apex, where there is a broad, smooth plate; the basal 2 abdominal segment closely longitudinally striated; the basal half of the 3rd at the sides more finely striated. ♀

Length 10 mm.; terebra 11 mm.

Kuching, December. Sadong, August.

Face smooth, bare, shining in the middle, the sides weakly punctured and haired; the clypeus bordered laterally by a pyriform fovea, deepest and widest below. Temples as long as the eyes, rounded behind. First abdominal segment twice longer than wide of equal width throughout; stoutly, irregularly

longitudinally striated, smooth in the centre at the base and, to a less extent, at the apex; the lateral furrows deep, obscurely crenulated; the 2nd segment strongly striated, the striæ interlacing; the basal area bordered laterally by a short, broad, smooth triangular one. Sutureiform articulation broad, irregularly striated; there is an almost smooth, triangular plate on the sides of the 3rd segment, their apices bordered by a broad, closely striated band. The abdomen is as long as the head and thorax united. Malar space with a wide shallow depression. The basal 2 joints of the fore tarsi together are longer than the tibiæ.

This species comes very near to *I. longitarsis*, Cam.; if it were not for the difference in the form of the plates on the 2nd abdominal segment, I might have considered them identical species; the central plate in the present species is long and narrow, becoming from the base gradually narrowed to a fine point; the lateral plates are much broader than long; in *longitarsis* the central plate has the basal half of equal width, the apical narrowed to a point; the lateral plates are longer than wide.

✓ *Iphiaulax pallidiorbitalis*, sp. nov.

Black, the head, antennal scape, pro-mesothorax, base of metathorax, anterior legs and middle coxæ, trochanters and femora, red; the outer orbits, malar space to shortly beyond the inner eye orbits and the base of the mandibles, pale yellow; wings fuscous, the nervures and stigma black. The 3rd to 5th segments of abdomen closely, regularly striated; the 2nd with the central area, extending to the apex of the segment, becoming gradually narrowed towards the apex; it is formed by 2 keels which unite shortly before the apex, towards which they are continued as one; in the centre is a keel extending from the base to the apex; at the base, on either side, is a short curved keel; the central area is bordered by transverse curved striæ, more or less broken; outside these are 2 irregular longitudinal keels which are united at the base; the space between these and the outer edge is smooth, except at the apex, which is irregularly reticulated. The sutureiform articulation is not

divided at the sides, which, at the furrow, are reticulated; there are no transverse furrows on the apex of the segments; there is a narrow crenulated furrow on the base of the 4th segment. The raised centre of the 1st abdominal segment is keeled down the sides and down the middle; on the sides are 3 or 4 irregular foveæ; the wide lateral furrows are irregularly transversely striated. Malar space nearly as long as the antennal scape, more than one third of the length of the eyes. Centre of face base, smooth, the sides sparsely haired. Temples as long as the top of the eyes, rounded, but hardly narrowed; the occiput rounded inwardly. Metapleural furrow distinct, continuous. On the centre of the apex of the metanotum are 3 stout keels, bordered at the end by a stouter transverse one. Front distinctly broadly depressed in the centre; there is a furrow down the middle. Tibiæ and tarsi densely covered with black stiff hair. The apical wing nervures are fuscous. ♂

Length 9-10 mm.

Kuching. March.

✓ *Iphiaulax longiceps*, sp. nov.

Black, the head, thorax and fore legs red, the middle legs of a darker red, their tarsi fuscous wings fuscous, the nervures and stigma black; the 2nd, 3rd and entirely the 4th abdominal segment to shortly beyond the middle closely, strongly longitudinally striated; the area on 2nd segment reaching to the apex, becoming gradually narrowed to a sharp point; somewhat strongly longitudinally striated; the raised central part of the 1st segment broadly furrowed down the middle, the furrow narrower than the sides, which are irregularly longitudinally stoutly striated, almost reticulated. Apical slope of metanotum stoutly longitudinally striated, the centre at the base raised, the raised part smooth at the base, the apex with a twisted keel. Sheaths of ovipositor broadly white at apex. ♀.

Length 13 mm., terebra 20 mm.

Kuching. December.

Cheeks slightly longer than the eyes, broadly depressed, more deeply above than below; above smooth and shining in



the middle, below closely, uniformly finely punctured. Face strongly, but not closely punctured, the middle below impunctate, finely, closely longitudinally striated. Middle of front distinctly depressed, the sides of the depression irregularly raised; in the middle is a keel which is wide above, gradually narrowed below. Temples two-thirds of the length of the eyes, rounded behind. The part bordering the keel on the 2nd abdominal segment at the base is stoutly transversely striated, followed by a smooth space; beyond is a long and a short curved longitudinal keel, the outer more curved than the inner; inside are 4 stout, curved oblique keels, the keel between the 2 portions is flat and becomes gradually widened; the apex on the outside is wide, depressed; the striæ on the outside of the 3rd segment are more curved and irregular than are those down the middle. The apex is smooth and shining; the apex of the striated lateral parts depressed; there is a curved depression on the sides of the striated part of the 4th segment near the apex. Centre of mesonotum depressed at the apex.

This species should be known by the long malar space and by the strongly striated metanotum.

✓ *Iphiaulax lineativentris*, sp. nov.

Black, the antennal scape, head, pro- and mesothorax, the anterior legs and the middle femora, red; wings fuscous, the nervures and stigma black; the 1st and 2nd abdominal segments strongly, the 3rd more finely, except at the apex, and the basal half of the 4th still more finely striated; the 2nd segment as long as the 1st, fully one fourth longer than wide, the 3rd slightly longer than wide; the raised central part of the 1st segment deeply furrowed in the middle, the apex of the furrow narrowed to a point, the basal half of the sides raised, flat, with a fovea at the base and apex, both obliquely narrowed at the apex, almost the apical half of the sides depressed, the depression divided by an oblique keel: the keel on the 2nd segment extends from the base to the apex, is not very broad at the base and becomes gradually narrowed to a point, and is closely, somewhat strongly striated; the raised

central part of the segment is not very clearly defined and becomes slightly narrowed towards the apex, near which, on the sides, is a fovea, narrowed at the base and apex, longish, the basal 3 segments, together, are almost as long as the head and thorax. Face smooth in the middle, the sides sparsely punctured; the clypeus aciculated strongly. Metapleural furrow wide, undivided. Temples rounded not narrowed obliquely, as long as the top of the eyes; the occiput transverse. Apical half of mesonotum flat. Apex of ovipositor broadly white. ♀

Length 13 mm.; terebra 24 mm.

Kuching. July.

Legs with the pubescence moderately dense and long. Apical slope of metanotum with a stout keel bordered by distinct furrows. The outer furrow on the 1st abdominal segment is aciculated, the apex depressed and more shining; the base and apex of the basal and apical parts stoutly, transversely striated, 4 on each end, the basal stouter than the apical. The black ventral spots occupy almost the whole of the segments. Malar space as long as the eyes.

May be known by the long 2nd abdominal segment with its striated keel extending from the base to the apex, by the stout keel, bordered by furrows, on the apex of the metanotum and by the long malar space. It is allied to *I. longiceps* which has the apical slope of metanotum striated throughout, and has the 2nd abdominal segment only as long as the 3rd. The ventral marks are larger than usual.

✓ *Iphiaulax declinatus*, sp. nov.

Black, the antennal scape, head and thorax bright red; the fore legs of a more obscure red; the middle tinged irregularly with red; wings fuscous the stigma and nervures black; the apex of the sheaths of the ovipositor from shortly beyond the middle white. Basal half of 1st abdominal segment smooth, impunctate; unstriated; the raised middle of the apical half with a fine keel down its centre its sides clearly margined; there are a few irregular striæ on them; the lateral

furrows wide, shallow, smooth. The area on the 2nd segment becomes gradually narrowed to a fine point, longer than it is wide at the base; the part bordering it is irregularly, stoutly reticulated; the outer division is depressed in the middle and obliquely striated, the striæ more regular at the apex than at the base; the 1st transverse furrow is deep, stoutly, but not closely crenulated; at its sides near the outer edge is a large irregular smooth space; the 2nd furrow is narrower and more closely crenulated; there is a narrow, smooth furrow on the base of the 5th segment. Abdomen clearly longer than the head and thorax united. There is a distinct furrow down the centre of the front.

Allied to *I. trichiothecus*, Cam.; it is a stouter species, with the back of the abdomen not suffused with rufous, the central part of the 1st abdominal segment is of equal width, not narrowed towards the apex, the central keel is much shorter, not half the length of the segment, this keelless basal part being perfectly smooth; in *trichiothecus* the keel extends from the apex to the base, the sides being more or less striated-reticulated.

✓ *Chaolta laticauda*, sp. nov.

Red, the flagellum of antennæ hind legs, except the base of coxæ, the abdomen in the centre of the 1st segment, the apical 3, and the sheaths of the ovipositor, black; the middle abdominal segments largely suffused with rufous; wings fuscous, tinged with violaceous, the nervures black, the stigma black, suffused with testaceous. ♀

Length 12 mm.; terebra 13 mm.

Kuching. December.

The keel between the antennæ is stout; the plate is not very prominent, broader than long depressed, gradually widened towards the apex; the keel only extends to its base. Centre of face broadly depressed, finely rugose, the sides rounded, smooth. Tips of mandibles black. Flagellum of antennæ densely covered with short, stiff black pubescence. Thorax long, narrow, flat above, without furrows; the metapleuræ with a wide, shallow furrow in the middle. First abdominal

segment flat, the centre clearly separated, of equal width, closely longitudinally striated, the striæ more distinct and more widely separated at the apex; the sides become slightly, gradually wider towards the apex and are closely finely striated; the 2nd, 3rd and 4th, segments are closely, distinctly longitudinally striated, the striæ becoming gradually weaker, and have oblique furrows on the sides at the base; the 2nd is raised in the middle, without an area.

The frontal plate is smaller, much less prominent than in *C. fuscipennis*, Cam.; and *C. ruficeps*, Cam.; it differs, further, in having the abdomen flatter, largely tinged with rufous, the sheaths of the ovipositor are broader and more densely pilose.

#### B.—On new *Ichneumonidae*.

##### *Hytophatnus*, gen. nov.

Head very little developed behind the eyes, the occiput broadly rounded inwardly; the face and clypeus flat, not separated by a suture, the apex of the latter broadly rounded. Mandibles not broad, the upper tooth long, sharp-pointed, the sub-apical short, turned inwardly. Scutellum flat, longer than wide, the sides not keeled. Metanotum short, the apex with an oblique, straight slope; the basal slope without clearly defined areæ, the areola only separated from the lateral by being rough, instead of smooth and shining; the apical 3 are separated only by the fact that the centre is depressed; the only distinct keel on the segment is one round the apical slope and one round the top of the pleuræ; the former is dilated into a blunt tooth near the middle; there is a broad keel over the metasternum. Post-petiole distinctly separated, depressed in the middle at the base; the gastracæli broad, united by a deep depression. Legs (especially the hinder) stout; the hind coxæ larger and stouter than usual. Antennæ longer than the body, tapering towards the apex, not serrate. Areolet 5-angled; disco-cubital nervure unbroken; the transverse median nervure received shortly beyond the transverse basal.

The characteristics of this genus are the unseparated, rounded at the apex, clypeus, short temples, longish malar

space, the long upper and short lower teeth of the mandibles, the confluent basal area of the metanotum, and the tuberculate base of the post-scutellum. I am not sure, until the ♀ is known if it belongs to the *Ichneumonini* or to the *Joppini*.

✓ *Hytophatnis lineatus*, sp. nov.

Black, the sides of the face broadly, of the clypeus narrowly, the black central part on the clypeus being broader, and more irregular than that on the face, mandibles, except at the apex, palpi, the eye orbits—the line widened on the vertex—a line on the pronotum, a broader one on the apical half of the propleuræ below, the mesopleuræ from shortly below the middle, tubercles, tegulæ, scutellums, a semicircular longitudinal mark on the sides of the apex of the metanotum, the rounded part on the outside, a small and a larger mark below the hind wings, a large irregular mark, narrowed above, on the apex of the metapleuræ and broad bands on the apices of the abdominal segments yellow. Legs fulvous, the 4 anterior tinged with yellow in front, the coxæ and trochanters yellow, the hind coxæ on the outside broadly in the middle, the hind knees and the apex of the hind tibiæ, black; the hind tarsi yellow. Antennæ broadly white in the middle. Wings hyaline, the nervures and stigma black. ♀.

Length 9 mm.

Kuching. September.

Densely covered with a white down; smooth, the middle of the face and the mesonotum weakly punctured, the mesonotum with a plumbeous hue. Metanotum sparsely punctured, more densely haired than the rest of the thorax. The post-petiole and the 2nd and 3rd segments closely longitudinally reticulated-striated. Legs shortly, densely pilose.

JOPPINI.

*Aulojoppa*, gen. nov.

Head cubital, the temples wide, the occiput roundly incised, not margined. Clypeus separated from the face, its

apex broadly, distinctly round. Mandibles broad, curved, the teeth large clearly separated, sharply pointed, the upper longer than the lower. Apical half of pronotum projecting, especially at the apex, which forms an incision with the tegulæ. Basal slope of mesonotum with distinct parapsidal furrows. Scutellum not much raised, not margined, wider than long. Metanotum regularly areolated the areola longish horse-shaped. Apex of abdomen bluntly pointed; it has an ovipositor as long as the apical two segments united. Areolet 5-angled; the 2nd transverse cubital nervure is faint, longer and more obliquely sloped; the transverse median nervure in hind wings broken near the bottom.

The labrum is hidden; the disco-cubital nervure unbroken by a stump; the transverse median nervure interstitial; the basal area of metanotum confluent; the cheeks are margined; the post-petiole is not clearly separated and closely longitudinally striated; the last abdominal segment large, as long as the penultimate. The apex of the metanotum ends laterally in 2 small, but distinct teeth. The hind femora reach to the base of the 4th segment, the legs being short and slender. Eyes large, parallel; the malar space small. There are distinct parapsidal furrows on the base of the mesonotum.

The distinctive characteristics of this genus are the large, cubital head, the rounded apex of the clypeus, the distinct furrows at the base of mesonotum, the broad scutellum and the long projecting ovipositor.

√ *Anlojoppa spilocephala*, sp. nov.

Black, 2 large marks, roundly narrowed on the innerside, on the sides of the face, the clypeus, except at the top, a large pyriform mark—the narrowed end in front,—on the sides of the vertex, a broad line in the middle of the outer orbits close to the eyes, a line on the apical third of the pronotum, and of the propleuræ below, tegulæ, scutellum, a large, somewhat triangular mark on the sides of the metanotum, covering the spines, the base of the 1st abdominal segments and the apices of the others—those on the 3rd, 4th and 5th broadly dilated

laterally—the apical entirely, yellow. Legs yellow; the 4 anterior femora below, the posterior entirely, the hind coxæ, trochanters, femora and apex of tibiæ, rufescent. Antennæ black above, pale yellow below. Wings hyaline, the nervures and stigma black. ♀

Length 10 mm.; terebra 1 mm.

Kuching. February.

Head smooth, shining; the front strongly, closely reticulated, the raised central part of the face closely, finely longitudinally striated. Mesonotum opaque, impunctate towards the apex in the centre, irregularly, weakly striated. Base of metanotum smooth; the rest weakly irregularly longitudinally striated. Propleuræ smooth, irregularly striated in the middle below; the base and lower part of the mesopleuræ finely punctured, the metapleuræ, if anything, more weakly punctured. Post-petiole strongly, closely, the 2nd segment weakly striated, except at the depressed base, where the striation is much stronger. The base and lower part of the sheath of the ovipositor is pale yellow.

*Cratojoppa ornaticeps*, sp. nov.

Black, the face, except a broad line of equal width down its middle, clypeus, mandibles except at apex, palpi, the inner orbits, the line narrowed below and wide on the incision opposite the ocelli—the incision gradually narrowed towards the middle, the line going round the top and down the outer orbits on which it becomes gradually widened from the top to the bottom, a line on the sides of the pronotum, not extending on to the base, a line on the lower part of the base, tegulæ, tubercles, 2 longish lines in the middle of mesonotum, the scutellur keels, sides of scutellum, post-scutellum, a triangular mark—the narrowed end at the base—the apex with a triangular incision,—behind the hind wings, an irregular mark, gradually narrowed below, on the sides of the apical slope of the metanotum, a broad line, extending from the base to the apex, on the lower part of the mesopleuræ, its base oblique, straight, the apex narrowed and rounded, and broad

lines on the apices of the abdominal segments—the basal 5 dilated at the sides, the 6th of equal width, the 7th also of equal width and occupying the apical three-fourths of the segment,—bright lemon-yellow. Antennæ broadly ringed with white—the white part wider than the black basal or apical. Legs yellow, the hind femora fulvous; an irregular line, dilated in the middle on the hinder part of the 4 anterior femora, a line, narrowed at the base, on the hinder part of the 4 anterior tibiæ, the apical three joints of the 4 anterior tarsi, the hind coxæ, except broadly at the apex above and more regularly and narrowly at the apex below, the base of the basal joint of the trochanters, the apical one more irregularly, and the apical fourth of the hind femora and tibiæ, black. Wings hyaline, the nervures and stigma black. ♀.

Length 14 mm.

Kuching. June.

Head smooth, the face and clypeus sparsely punctured in the middle; it is wider than the thorax; the temples wide, roundly narrowed, the occiput roundly, deeply incised, margined. Pro- and mesothorax smooth; the apex of propleuræ obliquely, finely punctured; the apical half of the mesonotum in the centre with large, deep punctures, placed irregularly, the base in the centre weakly irregularly punctured. Areola smooth; the basal lateral areæ of metanotum strongly deeply punctured, the apical strongly transversely striated. Pro- and upper half of mesopleuræ smooth, the lower half of the latter closely finely punctured; the metapleuræ coarsely punctured. Post-petiole finely, closely striated in the middle, the sides with large scattered punctures; the 2nd, 3rd and 4th segments are strongly, the 5th weakly longitudinally striated.

*C. rufo-femora*, Cam. May be known by the areola being irregularly strongly punctured on the apical half and by the basal abdominal segments having separated spots, not continuous lines. From the Indian known species it may be known by the black mark on the face, by the black areola, which is also shorter and not transverse at the apex, but rounded inwardly.



## CRYPTINÆ.

✓ *Mesostenoides angulicollis*, sp. nov.

Black, a large mark in the centre of the face, rounded above, slightly narrowed below, a line on the sides, rounded, narrowed above and below, clypeus, mandibles, except at the apex, a line on the upper inner orbits, rounded, narrowed above and below, a narrow line, interrupted in the middle, on the base of the prothorax, a broad raised line in the middle of pronotum, tegulæ, scutellums, metanotal spines, and broad lines on the apices of the abdominal segments—the 1st and last broader than the others, yellow. Legs reddish fulvous, the 4 anterior coxæ and trochanters and the upper side of the hind coxæ, yellow, the rest of the hind coxæ, the apex of the hind femora and the base of their tibiæ, black. Antennæ broadly white in the middle. Wings hyaline, the stigma and nervures black.  
♀.

Length 11 mm.

Kuching. February.

Head, if anything, wider than the thorax; the face somewhat strongly punctured, the clypeus less closely punctured above, smooth below, covered with white pubescence. The part between the ocelli and the frontal depression bearing stout, more or less, curved striæ. Base of thorax above broadly rounded; a rounded incision between the yellow dilated part of the pronotum and the black apex, which is rounded. Mesonotum finely rugose, more or less striated at the base. Scutellum roundly raised, longer than wide, the apex with a rounded slope; it is almost smooth; the basal depression is large and has 4 stout, slightly converging keels; there are stout lateral keels on the basal slope. On the metanotum there is a distinct petiolar area, which is smooth and depressed at the base; on the apex are 3 stout irregular transverse striæ; the base on the sides closely, mostly transversely reticulated; the transverse keel is stout and is roundly curved towards the base in the middle; the rest of the metanotum is strongly, widely reticulated, the reticulations irregular, more or less angled. The upper

part of the propleuræ is covered with close oblique striæ, bordered behind by a stout keel; below it bears stout, clearly separated, longitudinal keels. Meso- and metapleuræ stoutly reticulated, covered with white pubescence; the former with a large, smooth and shining space at the apex. The 1st abdominal segment is broad at the base, becoming gradually wider towards the apex; the sides are high, bordered above and below and are roundly incised on the ventral side at the apex; the 2nd and 3rd segments are closely, distinctly punctured; the 4th is weakly punctured, the others almost smooth. Metanotal spines large, prominent, conical, yellow. Areolet longer along the transverse cubital nervures than along the radius; the 2nd transverse cubital faint; the recurrent nervure is received near the apex; the transverse median behind the transverse basal; the transverse median in hind wings is broken not far from the top of the lower third.

*Mesostenoides* is a *Mesostenus* with spined metanotum. It may be as well to differentiate it from the Bornean allied genus *Vagenatha*. The differences may be expressed as follows:

Base of thorax above transverse, laterally projecting into stout, large teeth; metanotum without a transverse keel and no petiolar area; the lower sides of the petiole at the base and apex spined, areolet large, longer than wide.

*Vagenatha*, Cam.

Base of thorax rounded, not toothed, metanotum with a transverse keel and petiolar area, the lower sides of abdominal petiole not spined; areolet small, almost square.

*Mesostenoides*, Ashm.

In *M. angulicollis*, the labrum is incised in the middle; this is not the case with *M. carinisentes*, Cam., from Sikkim; the latter species differs further in the scutellum being flat and keeled to the top of the apical slope.

## PIMPLINÆ.

### *Acenitini*.

#### *Xoridesopus*, gen. nov.

Arolet small, almost square. Disco-cubital nervure unbroken. Transverse median nervure received distinctly

before the transverse basal. Transverse median nervure in hind wings broken below the middle. Median segment with 2 transverse keels; its spiracles small, longish oval. Hind legs not unusually long, the basal joint of the hind tarsi as long as the following 4 united the fore tibiæ compressed at base. Apex of clypeus transverse, depressed obliquely; the apex bordered by a keel which curls round the sides, where it is more distinct. Apex of mandibles with 2 equally-sized teeth, clearly separated. Labrum large, projecting. Parapsidal furrows distinct to shortly beyond the middle. Basal half of mesosternum bordered by a curved furrow. Scutellum not prominent, not margined. All the claws are simple, not toothed. Ovipositor about one third of the length of the abdomen; it issues from the apex of the 5th segment; the 6th and following segments are cleft in the middle to receive it; there is no prominent, cultriform hypopygium. Temples short. Fore tibiæ short, stout, broadly, distinctly narrowed at the base; the hind coxæ are more than twice longer than thick; the fore tibiæ have one, the posterior four have 2 moderately long spurs; the legs are slender and, except as regards the fore tibiæ, are formed as in the *cryptinæ*. The 1st abdominal segment is roundly curved at the base; its sides are keeled above and below; the spiracles are placed before the middle.

The only group in which this genus can be placed is the *Acoenitini*; the form of the 1st abdominal segment and the position of its spiracles separate it from the *Cryptinæ*, with which it has a considerable resemblance. It has the inflated, contracted at the base, tibiæ of the *Xoridini*, but not the characteristic head of that group. On the other hand it has not the ploughshare-shaped, prominent hypopygium of the *Acoenitini*. So far as the alar neurulation is concerned it is as in the *Cryptinæ*, as e.g. in *Mesostenus*. The legs are shorter and more slender than in the *Acoenitini*. For the present I leave it in that tribe.

✓ *Xoridesopus annulicornis*, sp. nov.

Black, the sides of the face, the orbits all round, the band on the outer side becoming gradually widened below, the sides

and top of the clypeus broadly, labrum, palpi, a line on the lower edge of the propleuræ, tegulæ, a conical mark on the apex of the middle lobe of mesonotum, scutellums, a square, large mark between the two keels of metanotum, the apical slope except a small square black mark in the middle of the apex, tubercles, a mark, with the apical two-thirds dilated, the basal narrowed, its base projecting upwards and downwards, the base of the dilated part roundly curved upwards, the apex straight, oblique on the lower part of mesopleuræ, a conical mark below the hind wings, the upper part of the metapleuræ broadly, the base of the 1st abdominal segment, broadly, the apices of the 1st to 6th, the bands dilated backwards on the sides, a broad band on the middle and sides of the 7th segment, laterally projecting to the base, and the apex of the 8th broadly, above projecting to the base, where it becomes gradually narrowed, and the ventral segments, except the last, yellow. Antennæ pale yellow, the base and apex broadly black, the base more broadly than the apex—the 4 basal and the basal half of the 5th and the apical 7 joints. Legs with the coxæ pale yellow, the apical half of the hinder black below, the mark incised in the middle; the femora and trochanters fulvous, the hinder deeper in tint than the anterior, the tibiæ yellow, tinged with fulvous; the 4 anterior tarsi fuscous, the hinder white; the apex of the hind femora broadly black, wings hyaline, the nervures and stigma black. ♀.

Length 12 mm.; terebra  $2\frac{1}{2}$  mm.

Kuching. December.

Head smooth, the face sparsely pilose. Pro- and mesothorax smooth; the depression on propleuræ broadly striated; the upper part of the mesopleuræ depression striated more stoutly. Base of metanotum finely closely, longitudinally striated, the striæ interlacing; the part between the keels finely longitudinally reticulated; the apical slope coarsely transversely striated. Metapleuræ smooth at the base, the rest somewhat stoutly, obliquely striated. Basal 4 segments of abdomen closely punctured, the puncturation becoming gradually weaker. Hind tibiæ and tarsi sparsely, but distinctly spinose.

✓ *Hadrocryptus dentatus*, sp. nov.

Black; the facial tubercle, sides of face—the line slightly broader than the black central part—clypeus, labrum, a line on the upper inner orbits to the end of the top of the eyes, the outer to near the outer edge, base of mandibles to near the middle, base of pronotum, a longish oval mark on the sides of the middle lobe of mesonotum at the base another at the apex; scutellar keels, scutellum except at the base, post-scutellum, the keels at the sides of both, a broad reversed T-shaped mark on the apex of metanotum, its top rounded, the sides blunter, a curved line on the apex of propleuræ, tubercles, a mark, longer than wide, on the lower third of the apex of mesopleuræ, the apex of metapleuræ broadly, the mark obliquely narrowed above and below, and broad bands on the apices of the abdominal segments, the apical dilated backwards on the sides to the base of the segments, yellow. Four front legs yellow, the femora tinged above with fulvous; the hinder yellow, their femora tinged with fulvous, the outer side of the coxæ, the inner to near the apex, the apical joint of the trochanters on the innerside, the base of the femora narrowly, the apex more broadly—the band as long as the 2nd tarsal joint—and the apical 2 joints of the 4 anterior tarsi, black. The 5th to 13th joints of antennæ white. Wings hyaline, the nervures and stigma black. ♀.

Length 15 mm.; terebra 6 mm.

Kuching, Borneo. June.

Facial tubercle prominent, longish oval, twice longer than wide, blunter pointed and broader below than above, strongly punctured. Face and clypeus strongly punctured, the latter less strongly than the former; the apex of the clypeus transverse, the sides slightly projecting and there is a minute tubercle in the middle; the lateral projections leaf-like. Front and vertex smooth, punctured behind the ocelli. Mesonotum smooth, the apex in the middle finely punctured. Scutellum distinctly, not very closely punctured, the apical slope striated. The base of the metanotum has the basal half

smooth, the apical closely punctured; the space between the 2 keels reticulated, finely at the base, which, at the sides, is longitudinally striated; the apical slope is strongly, irregularly transversely striated. Propleuræ smooth, the middle depression striated, the striæ becoming longer towards the apex. Mesopleuræ, except at the apex, closely punctured, behind the dilated smooth apex is a band of clearly separated punctures; the lower part is more or less striated. Metapleuræ smooth, sparsely, but distinctly punctured at the base, the rest closely, stoutly obliquely striated. The dilated half of the petiole is sparsely distinctly punctured; on its apical half (of the apex) is an oval, longish, depression; at the base of this is a longish, more clearly defined longitudinal furrow, with obliquely sloped sides; the petiole is narrowed at the extreme base; from there it becomes gradually widened towards the apex; it is finely punctured; the 2nd, 3rd and 4th segments are closely, distinctly punctured, the puncturation becoming gradually weaker. Areolet large, longer along the radius than on the transverse cubital nervures, 5-angled; the recurrent nervure is received shortly beyond the middle.

Under the middle of the petiole, on the sides, are 4 short, distinct teeth; the basal 2 are more widely separated than are the apical, which are separated from each other by a slightly less distance than they are from the basal pair. The transverse median nervure in the hind wings is broken shortly, but distinctly below the middle.

This species may be known from *H. nasutus*, Cam., and *H. tuberculatus*, Cam., from the Eastern Himalaya by the teeth on the lowerside of the abdominal petiole, and by there being a small mark on the apex of the mesopleuræ instead of a large long mark, narrowed at the base along the lowerside, extending from near the base to the apex.

### C.—On two new species of *Mellinus*.

✓ *Mellinus nigrolineatus*, sp. nov.

Thorax pale testaceous, the metanotum pale yellow, the abdomen rufo-testaceous; the head, a broad line in the middle

of the basal half of mesonotum, a slightly narrower one on the apical three-fourths down the sides, the furrow at the base of the scutellum, the metanotal area, the central furrow, its apex, the centre of propleuræ broadly, the mesosternum, the apex of mesopleuræ and the base of metapleuræ, black; the apex of the petiole and the base of the dilated part broadly, infuscated; antennæ black, the scape yellowish, the basal joints of flagellum testaceous below. Wings hyaline, iridescent, the costa, stigma and nervures fuscous. ♀.

Length 10 mm.

Kuching. January 14th.

Face and clypeus densely covered with silvery pubescence as are also, but less densely, the sides of the front; the vertex is smooth, shining and sparsely haired. Below the antennæ is a transverse keel; between it and the base of the antennæ is a longitudinal plate, rounded and narrowed in the middle. Eyes large slightly diverging below, coarsely faceted. Thorax smooth, shining, sparsely haired; the furrow at the base of scutellum, stoutly crenulated. On either side of the metanotal area are six stout, clearly separated keels. The base of propleuræ stoutly, irregularly striated. The dilated apex of petiole large, longer than wide, pyriform. The mandibles are testaceous, tinged with yellow-collar transverse, margined at the base. Tibiæ fringed with white hair; the tarsi covered with darker, shorter, stiffer hair. The apical half of the metanotum has the sides transversely striated. The petiole is distinctly, roundly curved and is much more dilated than in *pygmacus* or *arvensis*; it is longer than the following 2 segments united.

✓ *Mellinus nigromaculatus*, sp. nov.

Rufo-testaceous, the head, the 3rd and following segments of the antennæ, a small irregular spot on the sides of the mesonotum at the base, a larger one near the centre, the furrows at the base and sides of the scutellum, the metanotal area, upper part of furrow, the base of mesopleuræ broadly, of the metapleuræ narrowly on lower half and the mesosternum, the

mark roundly dilated on to the mesopleuræ, black. Legs coloured like the body, but paler, the hinder darker tinted than the anterior. Head densely covered with silvery pubescence; the front with a distinct keel down the middle; except at the ocelli the front and vertex are dark rufo-testaceous. Mandibles yellowish to beyond the middle; the apex black, the part behind it rufo-testaceous. Antennal plate stout, roundly narrowed in the middle; there is no transverse keel below it. Scutellar furrow irregularly crenulated. Metanotal area large; in its middle are two widely separated keels; on either side are a few irregular striæ. Abdominal petiole curved, thickly nodose at the apex; it is as long as the following 2 segments united. Thorax sparsely covered with pale and fuscous hair. The keel bordering the base of the apex of pronotum is narrow, and is thinner in the middle than at the sides. Basal two segments of antennæ pale yellow, the others black, brownish below. Wings hyaline, highly iridescent, the stigma and nervures dark fuscous. ♀.

Length 8 mm.

Kuching. November 13th.

There may be a black mark in the middle of the mesonotum, forming a triangle with the basal pair. Ocelli in a triangle, the hinder bordered by a furrow on the outer side and separated from the eyes by a distinctly greater distance than they are from each other. Sides of pronotum at base roundly narrowed.

There are now three species of *Mellinus* known from Borneo. They may be separated thus:

- Thorax black; the head and thorax covered with golden pubescence; the metanotal area not clearly defined ... .. *crabiformis*, Sm.
- (b.) Thorax testaceous, marked with black; the pubescence on the head and thorax silvery; the metanotal area clearly defined, depressed.
- Mesonotum with 3 large black lines; the head black, entirely, the collar transverse, the sides not narrowed, a transverse keel on the face below the antennæ ... .. *nigrolineatus*.



Mesonotum with 3 spots in a curve; the head black and testaceous, the collar broadly, distinctly roundly narrowed, no transverse keel below the antennæ ... .. *nigromaculatus*.

D.—On some *Vespidæ*.

✓ *Icaria parvimaculata*, sp. nov.

Black, a short line on the base of the mandibles, a small mark on the sides of the clypeus shortly above the middle, 2, almost united, lines on the base of the post-scutellum, a line down the sides of metanotum, straight on the inner, rounded on the outside, a short line, dilated backwards in the middle, a narrow line on the apex of the 2nd abdominal segment and a narrow indistinct one on the apex of pronotum, pale yellow; wings hyaline, the apex broadly smoky in front, the stigma and nervures black in front. ♀.

Length to end of 2nd abdominal segment 6 mm.

Marup. May (J. Hewitt).

First abdominal segment as long as the second; its base narrow, the apex dilated roundly above, becoming gradually higher above; seen laterally the segment becomes gradually widened from the base to the apex; the 2nd segment cup-shaped, roundly narrowed at the base, shorter than it is wide at the apex, closely distinctly, almost uniformly punctured, the punctures more or less interlacing; the first segment smooth, shining; both are sparsely covered with white pubescence. Clypeus very shining, very sparsely punctured, almost smooth on the lower, more distinctly and closely on the upper half; it is slightly broader than it is long and ends in a distinct tooth.

In its black colouration this species approaches *I. lugubris*, Sm. and *I. flavolineata*, Cam., but it cannot be confounded with either; in form it more resembles *I. malayana* and *I. ornaticeps*.

*Icaria intermedia*, Cam.

This species (described from Java, Tijdsch. voor Ent. XLVIII) has been taken at Transan, Borneo in August. The band on the apex of the 2nd abdominal segment is slightly narrowed at the base in the middle.

*Icaria maculifrons*, Cam.

A very dark, blackish example of this species has been taken at Merdang in December.

*Icaria artifex*, Sauss.

Two very dissimilar specimens, as regards the size of yellow marks and their shape—one from Kuching in March, the other from Sadong in August. The usual yellow line on the sides of the petiole may be absent or greatly reduced; the shape of the marks on the 2nd abdominal segment varies, and the line on the clypeus may be black or red.